A Survey of the Crowding Out Problem in Deficit Finance

An Honors Thesis (HONRS 499)

by

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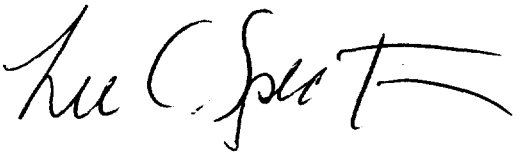

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PURPOSE OF THESIS

It has been argued that the deficit activity of the United States Federal Government -- spending in excess of its revenues -- hinders the private sector because it "crowds out" potential borrowers in the private sector. The objectives of this paper are to examine that hypothesis and survey some of the literature focusing on the crowding out problem. Background information on government deficits and debt is included, along with supporting U.S. macroeconomic data from 1940 through 1994. Other theorized downfalls of government deficits in addition to crowding out are presented, and a collection of empirical papers which attempt to either build or refute a link between deficits and higher interest rates is surveyed. Finally, two articles which look at the crowding out problem from very unique perspectives are presented.

THE MAKING OF A DEFICIT

A deficit[1] occurs when an individual spends beyond his or her level of income. The same is true for the U.S. government. It also experiences a deficit when its outlays are greater than its revenues. If receipts are in excess of total expenses, a budget surplus will result, but deficits have apparently proven more popular over the years. The federal government has experienced a surplus only eight times since 1940, with the last surplus occurring in 1969. In the 55 fiscal years from 1940 through 1994, the U.S. has ended its fiscal year with a deficit 85 percent of the time (Appendix A).

The government's primary means of receipts are taxes from individuals and corporations. Individual income taxes comprise the single biggest portion of receipts. Income taxes accounted for 44.2 percent of total revenues in 1993. Outlays are numerous, but spending on national defense had traditionally been the largest single item on the expense list. However, in 1993, social security expenses, representing 21.6 percent of the federal government's outlays, overtook defense expenditures as the single largest expense on the budget. Social security expenses are forecasted to continue increasing in the future, while defense expenditures are expected to decrease each year (Office of the President 1994).

When the government decides to spend beyond its means, it must do what any private household would do when purchasing a large item. The government enters the loanable funds market to secure a loan for more operating capital, much like a private household would enter the loanable funds market to purchase a house. The loans private households obtain are usually bank loans, in which a certain amount of principle is obtained at once and then repaid over a

1. Deficit and debt are often used interchangeably, but the terms describe two different measurements. A deficit is the amount government spends in excess of its receipts in one fiscal period. Debt is the total amount of borrowed dollars that still must be paid off. Debt is a liability to the government which represents lenders' claims on the government's assets. While a deficit covers only one fiscal period, debt is the accumulation of deficits and surpluses from every fiscal period.

number of years. Loans which the government takes out have a variety of forms. U.S. Treasury bills, for example, are short-term (3-12 mos.) promissory notes sold to private savers. When an individual purchases a T-bill, the funds are given to the government to use. Once the T-bill expires, the government must pay back the amount of principle plus interest, which compensates the saver for the use of his or her money.

Other debt instruments of the federal government include Treasury notes and Treasury bonds, both of which tie up savers' money longer than the T-bill. T-notes mature from three to five years, while T-bonds have a lifetime of 10 to 30 years, depending on the particular bond purchased. Because T-notes and T-bonds tie up money for a longer period of time, they have a higher interest rate to convince savers to give up the use of their money for a longer period of time.

AN EXPLANATION OF THE DATA COLLECTED

All annual surplus and deficit data, debt, interest payments, gross domestic product (GDP) and GDP deflators were collected from *Historical Tables: Budget of the United States Government*, printed by the Office of the President for fiscal year[2] 1996. Data on current dollar yearly deficits are listed from 1940 through 1994, the last year for which official numbers were available. All 1995 data are estimates taken from *Historical Tables*. All numbers were then indexed using a GDP deflator system, which is included in *Historical Tables* and is listed in Appendix D. The deflator uses 1987 as the base year.

Appendices A, B, C and D are located at the end of this paper. Appendix A lists nominal and real federal receipts, outlays and the resulting deficits or surpluses. Appendix B illustrates real federal debt at the end of each fiscal year, along with per-capita deficit and per-capita debt. Appendix C lists real deficit and real debt as percentages of real GDP.

All per-capita amounts were calculated using a spreadsheet and end-of-year U.S. population figures given in *Historical Tables* and publications of the U.S. Census Bureau. All per-capita amounts have been figured using real dollars rather than current dollars. All calculations, including per-capita figures, and all graphs have been made using real amounts. No calculations have been made using the nominal columns -- they are listed for completeness only.

Prior to 1977, the U.S. operated on a fiscal year beginning July 1 and ending the following June 30 before an adjustment in 1976. It now begins Oct. 1 of each year and ends the following Sept. 30. In order to make the shift, the three months from July 1, 1976, to Sept. 30, 1976, comprise their own fiscal period and is denoted as the transitional quarter (TQ). For simplicity in this study, it was ignored when constructing the graphs, since the transitional quarter covers only three months of government activity. However, it is listed in the data tables.

ANALYZING THE DATA

Real GDP has been steadily increasing since 1947 (Figure 1). It is incomplete, however, just to focus on the direction of GDP. Translating annual deficits into percentages of annual real GDP gives deficit amounts additional meaning (Figure 2). The more wealth a country has, the higher deficit it should be able to handle. This also holds for individuals. We would expect a wealthy businessperson to be able to undertake much more debt, such as a $3 million mortgage, with little concern rather than a high school student who earns minimum wage and works only 10 hours a week. America's real deficit in 1994 of $161 billion is an ominous amount at first glance, but when one realizes it was less than four percent of real GDP in 1994, the deficit seems quite manageable. Real debt at the end of 1994 totalled $3.7 trillion dollars. This is debt that has accumulated for several years, but it represents only 70 percent of real GDP for fiscal year 1994 alone. Households often borrow several times their annual income to purchase a home, but the U.S. will see more real aggregate income this year alone than the amount of debt it has stock-

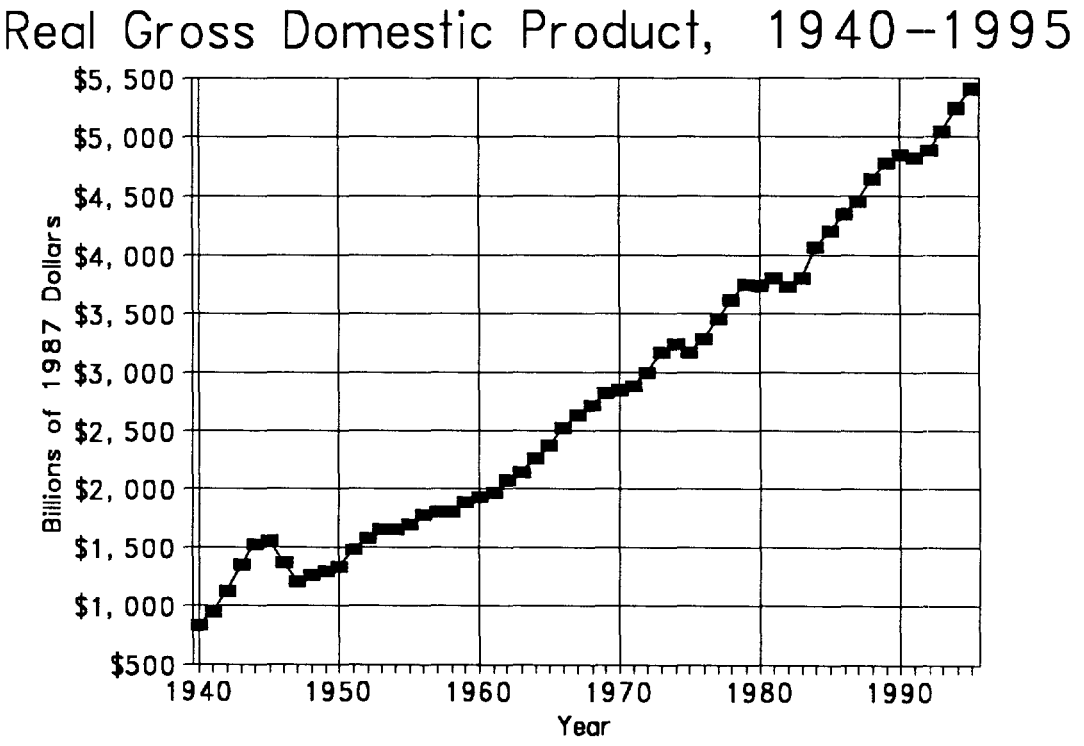

FIGURE 1

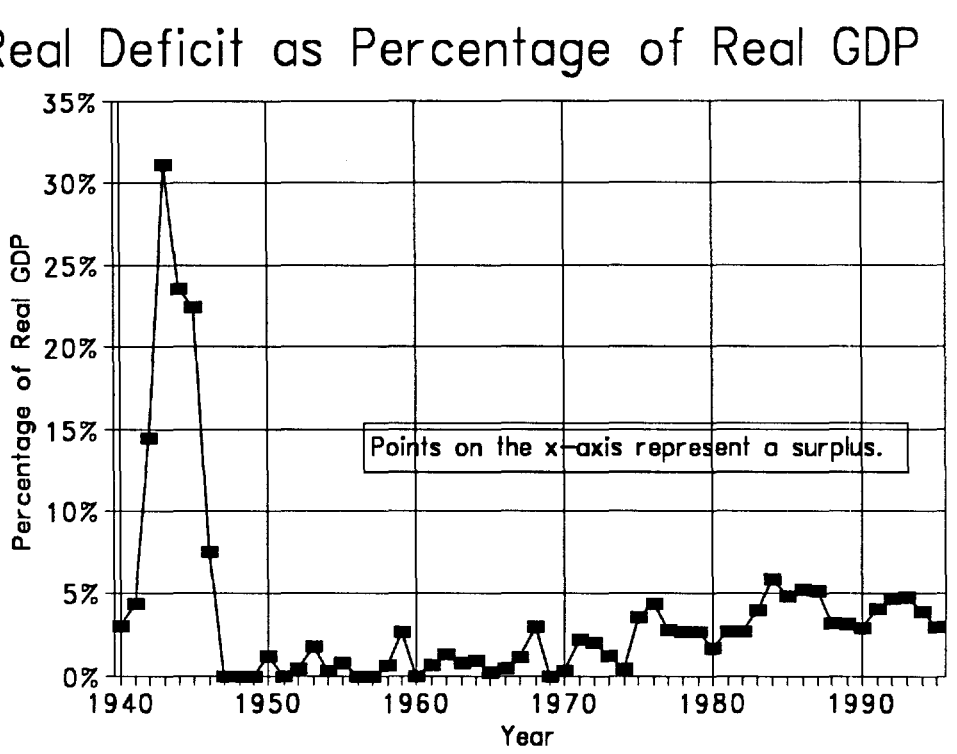

FIGURE 2

piled since the 18th century.

This is not to say that deficits and debt have no consequences on the welfare of a country. Operating a country's finances with a deficit is a cost of raising GDP, but if GDP raises substantially, the benefits will outweigh that cost. Since 1947, annual deficits as percentages of GDP have been fluctuating between zero and seven percent, but the graph shows a gradual increasing trend since the 1960s.

Annual real debt as a percentage of annual real GDP had been decreasing substantially from the World War II years until the late 1970s, when the trend bottomed out (Figure 3). Currently, the percentage has been steadily increasing since that time. Thus, even though real GDP has been increasing steadily, end-of-year debt as a percentage of GDP has been increasing annually since 1981 as well. This is not to infer that real GDP would not have increased without the additional debt -- this is simply the trend at this time.

While deficits and their resulting debt seem to be eating up larger percentages of GDP, per-capita annual real deficits have been decreasing since 1992. The highest per-capita real deficit

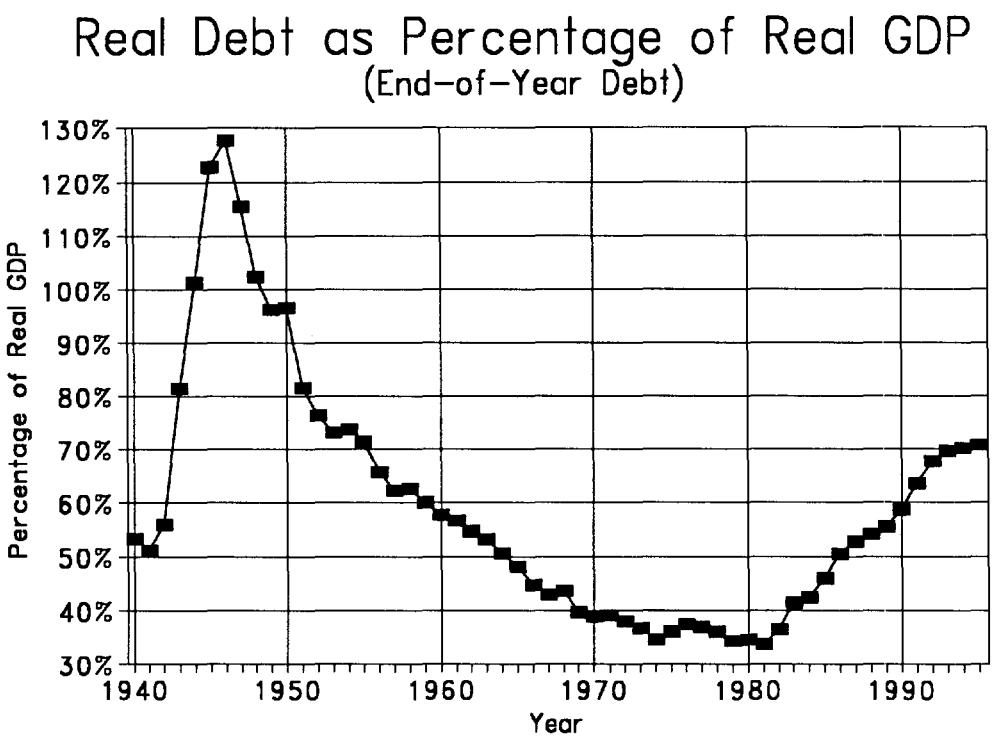

FIGURE 3

since 1962 was $1,014, which occurred in 1983. Per-capita real deficit totalled $936 in 1992 but has since decreased to an amount of $616 in 1994. Per-capita real debt, meanwhile, has increased each year since 1982 and amounted to $14,091 last year.

ARE DEFICITS BAD?

- ***Distinguishing Between Private and Public Debt***

When determining the usefulness and harmful effects of deficits, most people seem to approach government borrowing the same way they think about their own liabilities; the idea that "all debt is bad" generally prevails. Most would agree that the popular press has spent many words agonizing over the national debt. A number of attitudes about deficit spending, both positive and negative, stem from news stories and opinion columns. The first two items in this section detail common misperceptions about the harmful effects of government deficits. The last two items deal more with true economic inquiry and describe two viewpoints -- one that says deficit finance is harmful and the other holds that it is harmless. The negative viewpoint is a description of crowding out. The other viewpoint, a much more neutral paradigm, is a presentation of the Ricardo Equivalence Theorem -- the idea that each generation leaves behind wealth for future generations in order to "pay for" the debt it accumulated as a nation.

- ***Bankruptcy***

Bankruptcy occurs when a debtor, whether a business or a family, cannot pay its bills and creditors want their payments. Bankruptcy does not occur unless both of these conditions are met. Even if a business or family is unable to pay its bills in the current period, if its creditors do not come knocking on the door demanding to be paid, the debtor is not in bankruptcy.

The federal government has options available to it that individuals and businesses do not have. If it was in danger of defaulting on a loan, government could either raise taxes or print the money it needed to pay off the lender. Again, we are treating the lender as an individual who purchases a treasury bill. Both remedies would have noticeable consequences in other areas of the economy, but because the government has these options, it is a no-risk borrower and, consequently, practically any supplier in the market for loans is willing to lend to it. Because the

government has not yet been forced to increase its taxes substantially or monetize its debt, it would seem to run no risk of bankruptcy. We do not hear stories of the government unable to pay a bill or creditors running to government's door for fear of not getting paid. Thus, the idea of the government going bankrupt is unfounded. In fact, because the government is such a different entity from a family or a private business, it does not seem possible that bankruptcy could ever apply to the government.

- ***The Burden on Future Generations***

Deficit spending occurring in the current fiscal year creates debt which must be paid off sometime in the future. The government uses borrowed dollars today to spend on public goods which inevitably must be paid for. This practice concerns many people, thinking that our current generation could be causing an unnecessary strain to future generations.

What must be remembered is that public goods are rarely exclusive to one generation. A public good, such as a city park, may be designed and built during one fiscal year, but the current generation will not be the only group allowed to use it. When a park is built, it is intended to be used by the current generation and many future generations. Even though future generations may bear part of the cost of the park, they will most definitely derive enjoyment from the park. The park has a "spillover effect" because it will provide enjoyment and benefits to other groups of people besides the group that decided to build it. With the debt that carries over from year to year, the current generation which builds and uses the park and future generations which also use the park will share the cost of the public good.

When future generations pay on this debt, they are not paying older generations -- they are paying the debt off to themselves. When a generation pays a debt, it in effect is paying itself. The idea that one generation somehow makes interest and principle payments to an older generation is unfounded. A transfer of funds simply takes place within generations. Suppose a

grandfather is receiving annual payments from the government on a 30-year treasury bond he owns, and 10 years into the 30-year bond he dies. Can he take the bond with him to the grave and continue to receive payments? This is certainly not possible. Instead, he leaves the bond to his daughter in his will, and she will begin receiving interest payments on the debt instrument. Being middle aged, the daughter's generation is presumably the generation paying the most taxes in the current period. Thus, we see the generation is paying the debt to themselves. Even if the grandfather had not died before the 30-year bond had matured, the return on his saving must be left to someone, and in this case he would leave it to a member of the generation which presumably paid the majority of taxes which funded that return on his saving.

- ***The Three Levels of Crowding Out***

In a nutshell, the theory of crowding out says government deficits cause private consumption and investment to decrease from a tightening in the available supply of loanable funds. With the reasons mentioned earlier, the government is a sought-after borrower because it will never default on a loan. Supporters of the crowding out theory say that because the government puts extra demand on the loanable funds market, the equilibrium interest rate is artificially higher than it normally would be, thus "crowding out" potential private sector borrowers.

A graph of the loanable funds market in Figure 4 illustrates the crowding out phenomenon. Assume the government is running a balanced budget. The loanable funds market is in equilibrium at point a, given the supply curve S and the initial demand curve D. If government now endorses expansionary fiscal policy and borrows in order to increase its spending, the demand curve will shift right by the amount government borrows (Q" - Q') to become D'.

If the supply of loanable funds stays the same, the quantity of loans clearing the market will increase from Q' to Q*, but the interest rate will also undergo an increase as well -- from i1 to i2. When the government enters the loanable funds market as a buyer (demanding loans), total

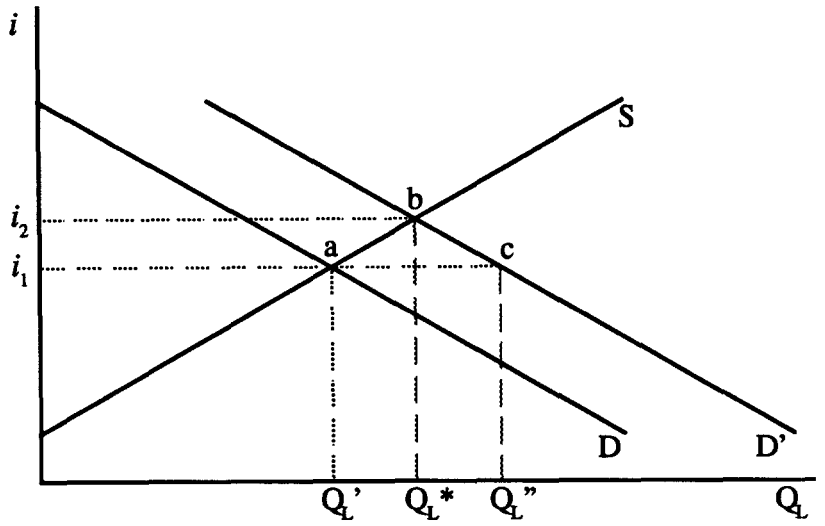

FIGURE 4

demand at the initial interest rate of i1 increases from Q' to Q". Because the supply schedule remains fixed, however, the interest rate will be bumped up to i2 and the quantity of loans clearing the market will only increase to Q*. The supply curve remains unchanged because we assume no one sees the increased demand for loanable funds.

The government receives the entire amount of loans it wants (Q" - Q') because it is such a low-risk borrower. Because the equilibrium quantity of loans only increases to Q*, however, an amount of Q" - Q* will be crowded out from the private sector to clear the path for additional government spending.

The magnitude of crowding out which takes place depends largely on the elasticities[3] of the supply and demand curves. In Figure 5, two supply curves are shown. S_1 is relatively inelastic,

3. Elasticity refers to the percentage change in quantity with respect to a given change in price, and it measures how responsive buyers and sellers are in a given market. Supply and demand curves that are more elastic are flatter (S_2 on Figure 5) than curves which are less elastic (S_1). The flatter, more elastic curve illustrates a bigger change in quantity when the price (in this model the interest rate) increases or decreases. With the S_1 supply schedule, suppliers of loanable funds are not very responsive to a change in the interest rate. Conversely, with the S_2 supply schedule, suppliers are much more responsive to a given change in the interest rate. Curves which are perfectly elastic are horizontal, illustrating that there is only one interest rate at which suppliers will offer loanable funds. Curves which are perfectly inelastic are vertical, and they graphically show that suppliers will offer one fixed amount of loans regardless of the interest rate. Elasticity of demand operates in the same fashion. It represents how responsive buyers are to a change in price.

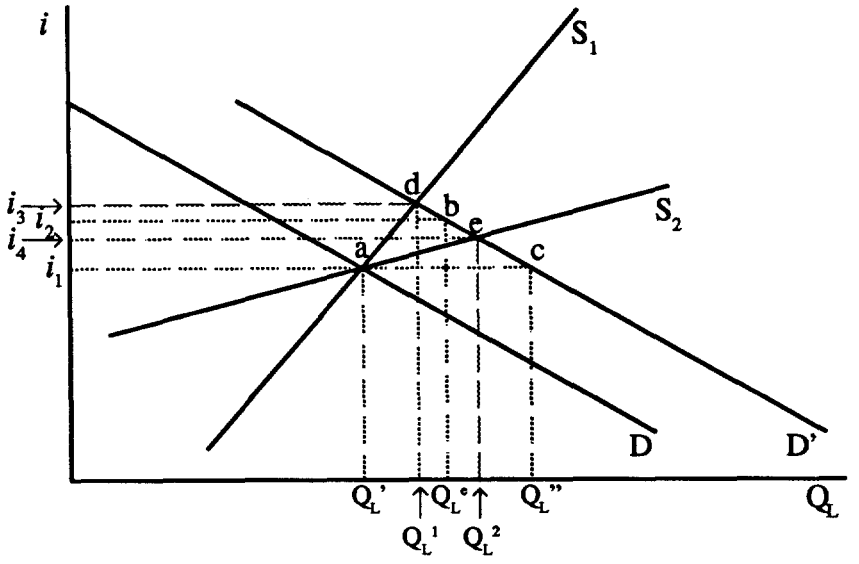

FIGURE 5

while S_2 is relatively elastic. This illustration shows that, everything else remaining the same, more crowding out will occur the more inelastic the supply curve is. This follows, because a relatively inelastic supply curve (S_1) requires a relatively larger increase in the interest rate to entice suppliers to increase the quantity of loanable funds they will offer. Theoretically, government's entry into the market would cause perfect crowding out if the supply schedule was perfectly inelastic (a vertical supply curve). Perfect, or complete, crowding out results in a dollar-for-dollar decrease in private spending with every borrowed dollar the government spends.

Figure 6 presents two sets of demand curves, of which D_1 is relatively inelastic and D_2 is relatively elastic. No matter which set we start with, the analysis begins with government operating with a balanced budget at point a (circled). With the D_1 system of demand curves, the new equilibrium quantity and the new equilibrium interest rate will be higher when the government enters the loanable funds market (illustrated by a shift from D_1 to D_1') than with the D_2 system of demand schedules. Analysis on the demand side of the market illustrates that the least crowding out will occur the more inelastic the demand curve is, all other factors unchanged. Government's entry into the loanable funds market would cause no crowding out if the demand schedule was perfectly inelastic (a vertical demand curve).

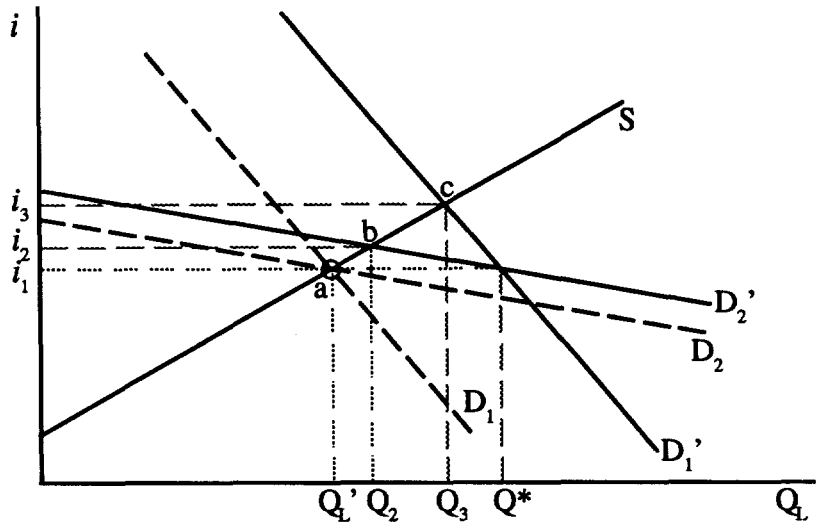

FIGURE 6

If crowding out is proven to exist and that it has a dampening effect on private consumption and investment, then government's historical tendencies to spend into a deficit must be examined to see if its expansionary fiscal spending is as "productive" as the private investment that is crowded out. Prag (1992) writes that even though crowding out can occur when government runs deficits, the projects being undertaken by government, such as highway construction, NASA and national defense, have social merit and, in some cases, may be more beneficial than the private spending that was crowded out. Spector and Van Cott (1992) share a similar idea, thinking that some government expenditures increase the value and effectiveness of existing capital spending in the private sector. Their article is presented toward the end of this paper.

- ***The Ricardian Equivalence Theorem***

The theorem was aptly named *Ricardo Equivalence Theorem* because, other than being named after Ricardo's influence on the idea, its economic examples show that "budget deficits and taxation have equivalent effects on the economy" (Barro 1989). Proponents of the Ricardian Equivalence Theorem believe that households know their future taxes will increase because of deficit spending in the current period. Thus, current budget deficits become costs to the current generation in the current period only. Ricardian Equivalence also requires a degree of altruism

-- people want their children and grandchildren to be better off than they are. Thus they will leave behind more bequests to offset any current deficit spending that is taking place. Therefore, when government undertakes expansionary fiscal policy to increase spending beyond its current receipts, Ricardian Equivalence is based on three premises: 1) deficit spending and increased taxation have equal effects on the economy, 2) people in the current period do not want to shift the burden of this current deficit on future generations and will take necessary action to make sure the burden is not shifted, and 3) the appropriate action taken is increasing private savings, which systematically increases the supply of loanable funds.

Figure 7 details the Equivalence theme. The illustration is exactly like Figure 4, except that now the supply of loanable funds increases the same amount the demand schedule increased. People now recognize that the government is going to increase its spending and will need to borrow the funds to pay for that increase. The amount government wants to borrow is met by the private sector, and as a result, no crowding out occurs. The interest rate remains at i1, ceteris paribus, but the quantity of loans clearing the market increases from Q_L' to Q_L".

Increased savings by the private sector, of course, dampens its consumption of goods and services, but does supply the loanable funds market with extra funds which the government will

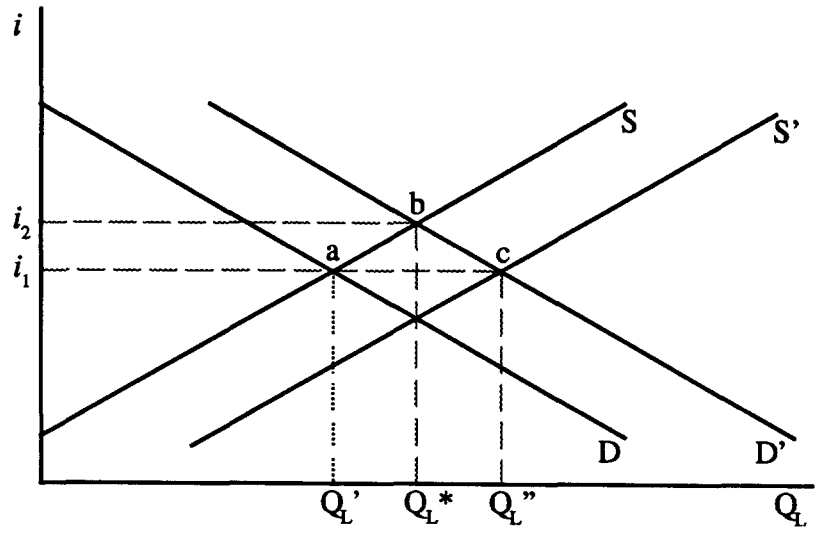

FIGURE 7

use in its deficit spending policy. It must be remembered that household savings are still classified as consumption in the classical aggregate model. Dollars flow out of consumption of goods and services and into saving, which the government borrows, resulting in no change in aggregate consumption or aggregate demand. On top of this, of course, is increased government spending, which in the end results in an overall increase in aggregate demand. If the government had chosen increasing taxes instead, this also would have decreased private consumption, but no resulting increase in private saving would have occurred. The outflow from consumption would have been channelled into government spending, and, unlike the above model, aggregate demand would experience no net change.

A SURVEY OF EMPIRICAL STUDIES

The Ricardian Equivalence Theorem says the private sector can foresee a budget deficit and will increase saving in order to minimize the costs to future generations. If this theory has merit, empirical studies would show that government deficits, which have been the norm in the U.S., have not led to substantial increases in the real interest rate. This has been a minority view in the economics profession, but a view that some economists, including Robert Barro, hold in high regard.

> "Overall, the empirical results on interest rates support the Ricardian view. Given these findings, it is remarkable that most macroeconomists remain confident that budget deficits raise interest rates." (1989).

Several empirical studies on the relationships between government deficits and the real interest rate have been conducted, including Evans' (1985, 1987a and 1987b) conclusions that no significant correlation exists between budget deficits and higher interest rates. In his two works in 1987, Evans even cites Ricardian Equivalence as a possible explanation for the fact that statistical evidence cannot be formulated to show a positive relationship between deficits and an increase in interest rates. Evans also goes outside the U.S. in one of his works and analyzed deficit and interest rate data in five other industrial countries besides the U.S.: Canada, France, Germany, Japan and the United Kingdom.

Hoelscher (1983) finds "no significant relationship between Federal borrowing and short term interest rates for the post-WWII period." From that premise, he also concludes that federal borrowing has very little crowding out effect when private expenditures are largely sensitive to short term rates only.

Arestis (1979) conducted an empirical study of crowding out effects in the U.K. His work did not focus solely on government deficits and interest rates, but looked at overall spending in the public and private sectors to see if statistical evidence existed for the crowding out argument.

He found that, with the exception of tax-financed government spending, crowding out did not occur. Thus, the models showed that increasing the money supply and undertaking deficit finance through issuing bonds did not crowd out an equivalent amount of private spending.

Cebula offers two studies which contrast with these articles. In his first article (1985), he defines investment as business purchases of new plant and equipment and correlates the ratio of investment to gross national product with the ratio of deficits to GNP over the time period from 1970 through 1982. Cebula finds statistical evidence supporting a crowding out effect which limits investment because of defict spending by the government. Because of the crowding out effects he finds, Cebula summarizes one short term and two long term consequences. Fiscal policy is rendered less powerful in the short run, while in the long run, diminished private investment causes slower economic growth and less capital formation.

In his second article, Cebula (1987b) shifts his focus from an investment ratio to the real interest rate. He formulates a model that statistically proves an increasing real defict to real GNP ratio exerts upward pressure on the real interest rate. Cebula used a real interest rate to account for business cycle effects, which will increase the nominal interest rate during economic expansion and decrease it during recessionary swings. In both articles, he used a deficit to GNP ratio rather than deficit amounts themselves, which resembles the discussion in section 4 of this paper. A government deficit is much more meaningful when it is expressed in real dollars relative to a country's income.

As this review of literature shows, certain economists have found no statistical evidence to support the existence of crowding out, while others have found such evidence. As the next section describes, however, statistical methodology is secondary if a model does not take into account all relative economic principles.

AN ALTERNATIVE VIEWPOINT

Spector and Van Cott (1988) analyzed the issue of crowding out from a different perspective. The authors are critical of empirical work which tries to connect government deficits with subsequent increases in interest rates. Certain situations exist where a government deficit will increase the interest rate but cause no crowding out. Another unique scenario occurs when a government deficit causes perfect crowding out, but does not affect the interest rate. Given these situations, Spector and Van Cott conclude that empirical data correlating government deficits and increases in the interest rate are incomplete in determining whether or not deficits lead to crowding out.

Closer attention should be given to the elasticities of the supply and demand of loanable funds. Assume we have a traditional demand curve, as shown in Figures 8 and 9. No crowding out will occur with a perfectly elastic supply of loanable funds, denoted by the horizontal supply curve in Figure 8. The horizontal supply curve is perfectly elastic because it shows that lenders will offer an unlimited supply of loans at only one interest rate. Any slight change in the interest rate has a large effect on the amount of funds lenders are willing to supply.

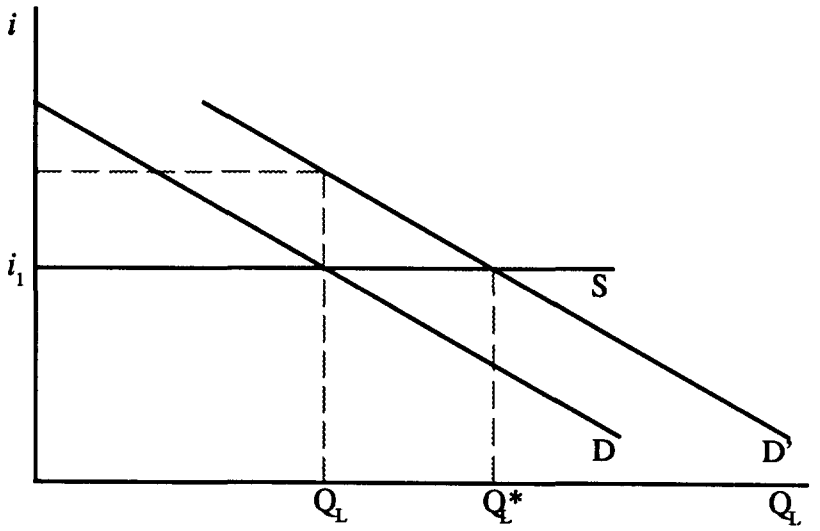

FIGURE 8 -- PERFECTLY ELASTIC SUPPLY
ZERO CROWDING OUT

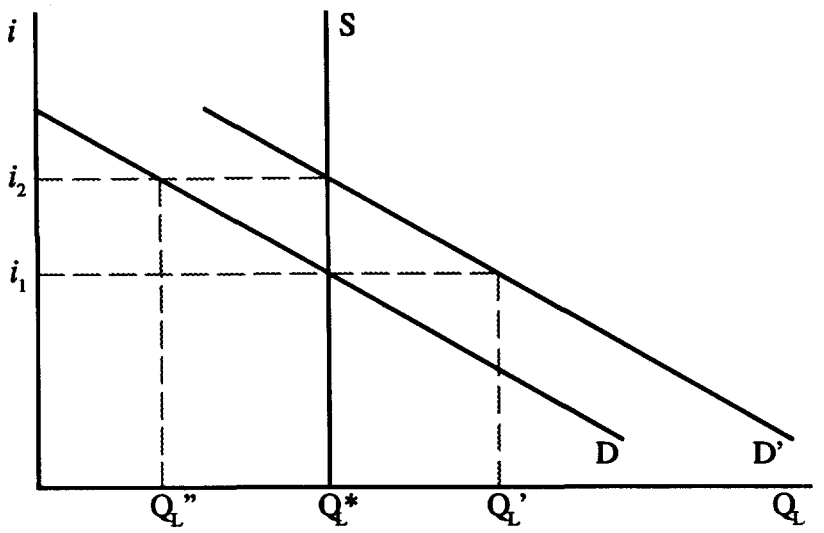

FIGURE 9 -- PERFECTLY INELASTIC SUPPLY
PERFECT CROWDING OUT

A vertical supply curve is perfectly inelastic, or completely unresponsive to price changes. In this situation, lenders will offer a fixed amount of loans at any interest rate, evidenced by the fact that any change in the interest rate has no effect on the amount of funds lenders will potentially supply (Figure 9). If the government borrows to finance more spending, the interest rate is pushed up but the supply of loans remains constant. Perfect crowding out occurs because the supply of loans is fixed.

Perfectly elastic and perfectly inelastic supply curves are extremes, but they represent the two ends of the crowding out spectrum. Using these opposite cases, we can quickly determine the degree of crowding out that will take place. Everything else remaining the same, with a highly elastic supply of loans (typical of a flat supply curve), little crowding out will occur. Conversely, with little elasticity of supply, the private sector faces a higher degree of crowding out.

Previous empirical articles highlighted earlier in this paper which hold that a correlation exists between higher interest rates and crowding out compare favorably with the two models presented above. Spector and Van Cott also inquire about the demand side of the loanable funds market, however. The following two models (Figures 10 and 11) will analyze a traditional supply curve with perfectly elastic and perfectly inelastic demand curves. It is here where the

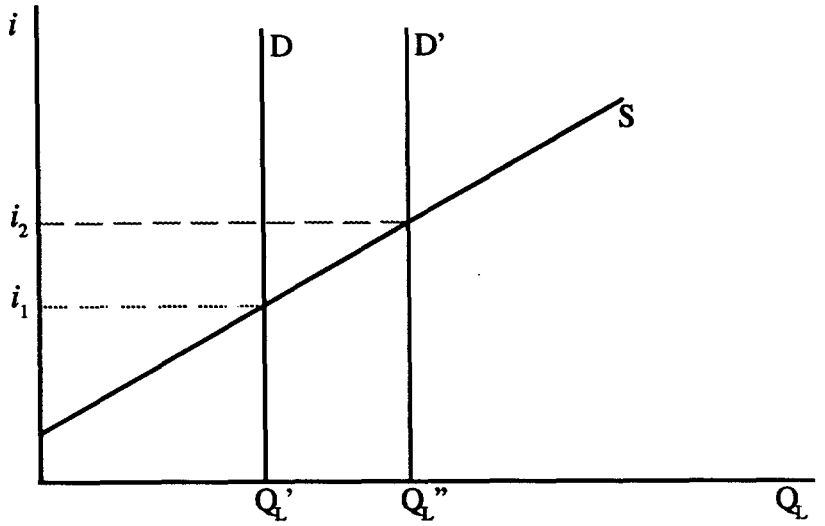

FIGURE 10 -- PERFECTLY INELASTIC DEMAND
ZERO CROWDING OUT

shortcomings of the empirical studies, which attempt to draw a correlation between increased interest rates and the occurrence of crowding out are revealed.

If demand is perfectly inelastic, it is totally unresponsive to price changes, or changes in the interest rate. When the government enters the loanable funds market (Figure 10), the demand curve shifts to the right from D to D'. The equilibrium interest rate increases from i1 to i2, the equilibrium quantity of loans increases from Q' to Q", but no crowding out occurs.

A perfectly elastic demand schedule is given in Figure 11, illustrating that the demand for loans is infinite at one particular interest rate (i1) and zero at all other interest rates. In this model, when the government enters the loanable funds market, perfect crowding out occurs. The demand schedule does not shift, even though more potential borrowers are entering the market. Unless the supply curve would shift to S', the quantity of loans is fixed at Q' and the interest rate remains unchanged at i1. Thus, we see a model where no change in the interest rate is associated with perfect crowding out -- an amount of Q" - Q'.

Using this additional analysis, it appears that certain empirical studies linking government deficits with an increase in interest rates is incomplete. Cebula (1987a) concludes he has found a transmission mechanism through which crowding out hits the economy, but Spector and Van

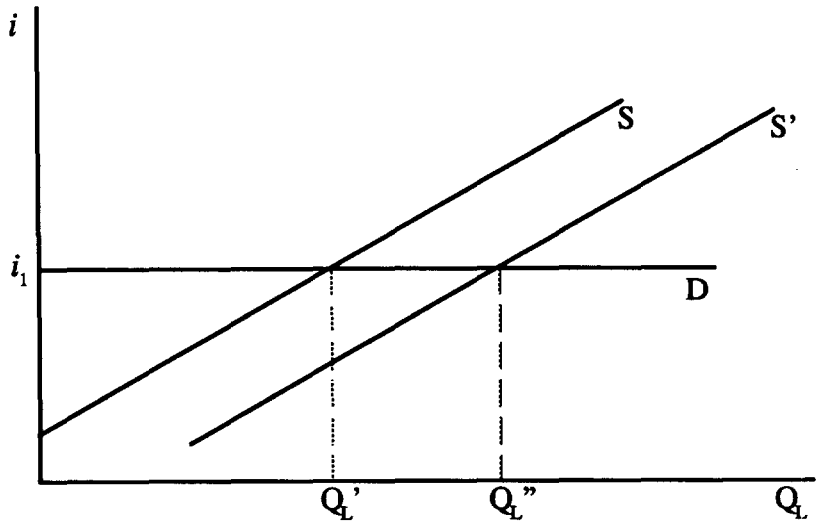

FIGURE 11 -- PERFECTLY ELASTIC DEMAND
PERFECT CROWDING OUT

Cott would argue that mechanism is incomplete based on the loanable funds models with perfectly elastic or perfectly inelastic demand.

In a second article, Spector and Van Cott (1992) assume the deficit spending the government is undertaking is having a positive effect on the economy. Specifically, they propose "a deficit (which) traces to spending initiatives that enhance the security and/or productivity of private property." They note that many of the empirical studies which test for a correlation between increased deficit spending and decreased private investment are not taking into account this deficit coefficient, which represents "allocative consequences of the government's marginal spending initiatives." Thus, this deficit coefficient recognizes the benefits of deficit spending.

The authors are not defending deficit spending with this analysis. However, they do point out, with the help of macroeconomic formulas, that an increase in the real interest rate brought about by a change in marginal deficit spending is positively related to the deficit coefficient. In other words, an increase in the efficiency of additional deficit spending can cause independent upward pressure on the interest rate. Spector and Van Cott came to a similar conclusion with private investment -- a positive deficit coefficient can spark increased investment because of the productivity of the additional government spending. Many of the economists conducting statisti-

cal surveys which either build or refute a link between deficit spending and crowding out are ignoring this deficit coefficient, but Spector and Van Cott hold that the increased security or productivity of private property as a result of additional spending by the government might be the very reasons the real interest rate is rising. In addition, their models show that with a positive deficit coefficient, the real interest rate and private investment can increase simultaneously. While other studies are simply formulating a statistical link among marginal deficit spending, interest rates and investment, Spector and Van Cott provide evidence that empirical studies which ignore certain variables, such as the deficit coefficient or elasticity of demand, do not tell the whole story.

CONCLUSION

Deficits and debt have received a considerable amount of negative press and publicity for many years. Despite the negative sentiment, however, the government continues to spend above its receipts. The information presented in this paper gives evidence both supporting the practice of deficit spending and evidence against it, but the central theme is that deficits can be measured and assessed in many ways. Some ways are correct, but many are wrong. A critic who only looks at the differences between annual deficit amounts in nominal terms is not going to be in favor of deficit spending. However, that critic would also be incorrect to jump to such a conclusion on the limited and rather meaningless data he or she is using. Because a myriad of variables are related to deficit finance, arriving at a simple conclusion of "deficits are good," or "deficits are bad" is difficult and unwise with limited information.

Economists have formulated the crowding out model as a consequence of deficits, and it will continue to be used in the deficit spending debate. However, there is no single method for applying the crowding out model. A deficit scenario which suffers from crowding out, according to one economist, might be deemed to have zero crowding by another. And, as the Spector and Van Cott articles discussed, a crowding out model can be wrongly applied to a deficit situation if only some of the key variables are used in the analysis. A model may appear to experience crowding out at first glance, but this same model could be argued to have no crowding out effects by another economist using a different system of variables.

Progress in the deficit spending debate can only continue with increased research and study of the true effects -- the real benefits and costs -- of government deficits. This paper presents different sides of this debate but makes few conclusions about which methods of analyzing government deficits and the potential crowding out effects that might follow are best. With continued research on this topic, it is hoped that more agreement on deficit spending will be reached, which in turn will leave less room for speculation.

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Appendix A – Annual Receipts, Outlays and Deficit or Surplus, 1940-1995

Year	Total Receipts (Millions)	Total Outlays (Millions)	Deficit or (Surplus) (Millions)	GDP Deflator (Base: 1987)	Real Receipts (Millions)	Real Outlays (Millions)	Real Deficit or (Surplus) (Millions)
1940	$6,548	$9,468	$2,920	0.1147	$57,088	$82,546	$25,458
1941	$8,712	$13,653	$4,941	0.1195	$72,904	$114,251	$41,347
1942	$14,634	$35,137	$20,503	0.1263	$115,867	$278,203	$162,336
1943	$24,001	$78,555	$54,554	0.1304	$184,057	$602,416	$418,359
1944	$43,747	$91,304	$47,557	0.1319	$331,668	$692,221	$360,553
1945	$45,159	$92,712	$47,553	0.1360	$332,051	$681,706	$349,654
1946	$39,296	$55,232	$15,936	0.1552	$253,196	$355,876	$102,680
1947	$38,514	$34,496	($4,018)	0.1855	$207,623	$185,962	($21,660)
1948	$41,560	$29,764	($11,796)	0.1954	$212,692	$152,323	($60,368)
1949	$39,415	$38,835	($580)	0.2028	$194,354	$191,494	($2,860)
1950	$39,443	$42,562	$3,119	0.2002	$197,018	$212,597	$15,579
1951	$51,616	$45,514	($6,102)	0.2110	$244,626	$215,706	($28,919)
1952	$66,167	$67,686	$1,519	0.2147	$308,184	$315,259	$7,075
1953	$69,608	$76,101	$6,493	0.2199	$316,544	$346,071	$29,527
1954	$69,701	$70,855	$1,154	0.2222	$313,686	$318,879	$5,194
1955	$65,451	$68,444	$2,993	0.2263	$289,222	$302,448	$13,226
1956	$74,587	$70,640	($3,947)	0.2345	$318,068	$301,237	($16,832)
1957	$79,990	$76,578	($3,412)	0.2425	$329,856	$315,786	($14,070)
1958	$79,636	$82,405	$2,769	0.2481	$320,983	$332,144	$11,161
1959	$79,249	$92,098	$12,849	0.2548	$311,024	$361,452	$50,428
1960	$92,492	$92,191	($301)	0.2609	$354,511	$353,358	($1,154)
1961	$94,388	$97,723	$3,335	0.2633	$358,481	$371,147	$12,666
1962	$99,676	$106,821	$7,145	0.2680	$371,925	$398,586	$26,660
1963	$106,560	$111,316	$4,756	0.2727	$390,759	$408,199	$17,440
1964	$112,613	$118,528	$5,915	0.2767	$406,986	$428,363	$21,377
1965	$116,817	$118,228	$1,411	0.2828	$413,073	$418,062	$4,989
1966	$130,835	$134,532	$3,697	0.2913	$449,142	$461,833	$12,691
1967	$148,822	$157,464	$8,642	0.3013	$493,933	$522,615	$28,682
1968	$152,973	$178,134	$25,161	0.3126	$489,357	$569,846	$80,489
1969	$186,882	$183,640	($3,242)	0.3283	$569,242	$559,366	($9,875)
1970	$192,807	$195,649	$2,842	0.3461	$557,085	$565,296	$8,211
1971	$187,139	$210,172	$23,033	0.3641	$513,977	$577,237	$63,260
1972	$207,309	$230,681	$23,372	0.3831	$541,135	$602,143	$61,008
1973	$230,799	$245,707	$14,908	0.4021	$573,984	$611,059	$37,075
1974	$263,224	$269,359	$6,135	0.4328	$608,189	$622,364	$14,175
1975	$279,090	$332,332	$53,242	0.4758	$586,570	$698,470	$111,900
1976	$298,060	$371,792	$73,732	0.5124	$581,694	$725,589	$143,895
TQ	$81,232	$95,975	$14,743	0.5308	$153,037	$180,812	$27,775
1977	$355,559	$409,218	$53,659	0.5538	$642,035	$738,927	$96,892
1978	$399,561	$458,746	$59,185	0.5957	$670,742	$770,096	$99,354
1979	$463,302	$504,032	$40,730	0.6474	$715,635	$778,548	$62,913
1980	$517,112	$590,947	$73,835	0.7058	$732,661	$837,273	$104,612
1981	$599,272	$678,249	$78,977	0.7776	$770,669	$872,234	$101,565
1982	$617,766	$745,755	$127,989	0.8355	$739,397	$892,585	$153,189
1983	$600,562	$808,380	$207,818	0.8702	$690,142	$928,959	$238,816
1984	$666,457	$851,846	$185,389	0.9085	$733,580	$937,640	$204,061
1985	$734,057	$946,391	$212,334	0.9432	$778,262	$1,003,383	$225,121
1986	$769,091	$990,336	$221,245	0.9712	$791,898	$1,019,703	$227,806
1987	$854,143	$1,003,911	$149,768	1.0000	$854,143	$1,003,911	$149,768
1988	$908,954	$1,064,140	$155,186	1.0363	$877,115	$1,026,865	$149,750
1989	$990,691	$1,143,172	$152,481	1.0830	$914,765	$1,055,560	$140,795
1990	$1,031,321	$1,252,705	$221,384	1.1295	$913,077	$1,109,079	$196,002
1991	$1,054,272	$1,323,441	$269,169	1.1764	$896,185	$1,124,992	$228,807
1992	$1,090,453	$1,380,856	$290,403	1.2112	$900,308	$1,140,073	$239,765
1993	$1,153,535	$1,408,675	$255,140	1.2400	$930,270	$1,136,028	$205,758
1994	$1,257,745	$1,460,914	$203,169	1.2643	$994,815	$1,155,512	$160,697
1995	$1,346,414	$1,538,920	$192,506	1.2984	$1,036,979	$1,185,243	$148,264

Appendix B -- Per-Capita Deficit and Per-Capita Debt, 1962-1994

Year	Real Deficit or (Surplus) (Millions)	End-of-Year Population (Millions)	Per-Capita Defict or (Surplus)	Multiple of 1962 Per-Cap.	End-of-Year Debt (1987 Dollars)	Increase from Previous Year	Multiple of 1940 Real Debt	Annual Per-capita Real Debt	Multiple of 1940 Per-capita
1962	$26,660	186.538	$143	1.00	$1,130,328	1.70%	2.56	$6,060	1.00
1963	$17,440	189.242	$92	0.64	$1,137,968	0.68%	2.57	$6,013	0.99
1964	$21,377	191.889	$111	0.78	$1,142,244	0.38%	2.58	$5,953	0.98
1965	$4,989	194.303	$26	0.18	$1,139,738	-0.22%	2.58	$5,866	0.97
1966	$12,691	196.56	$65	0.45	$1,127,697	-1.06%	2.55	$5,737	0.95
1967	$28,682	198.712	$144	1.01	$1,129,920	0.20%	2.56	$5,686	0.94
1968	$80,489	200.706	$401	2.81	$1,179,415	4.38%	2.67	$5,876	0.97
1969	($9,875)	202.677	($49)	-0.34	$1,114,130	-5.54%	2.52	$5,497	0.91
1970	$8,211	205.052	$40	0.28	$1,100,610	-1.21%	2.49	$5,367	0.89
1971	$63,260	207.661	$305	2.13	$1,121,055	1.86%	2.54	$5,398	0.89
1972	$61,008	209.896	$291	2.03	$1,137,917	1.50%	2.57	$5,421	0.89
1973	$37,075	211.909	$175	1.22	$1,159,639	1.91%	2.62	$5,472	0.90
1974	$14,175	213.854	$66	0.46	$1,118,052	-3.59%	2.53	$5,228	0.86
1975	$111,900	215.973	$518	3.63	$1,138,976	1.87%	2.58	$5,274	0.87
1976	$143,895	218.035	$660	4.62	$1,227,498	7.77%	2.78	$5,630	0.93
TQ	$27,775		—	—	$1,212,436	-1.23%	2.74	—	—
1977	$96,892	220.904	$439	3.07	$1,275,547	5.21%	2.89	$5,774	0.95
1978	$99,354	223.278	$445	3.11	$1,303,680	2.21%	2.95	$5,839	0.96
1979	$62,913	225.779	$279	1.95	$1,281,233	-1.72%	2.90	$5,675	0.94
1980	$104,612	228.468	$458	3.20	$1,287,971	0.53%	2.91	$5,637	0.93
1981	$101,565	230.848	$440	3.08	$1,279,379	-0.67%	2.89	$5,542	0.91
1982	$153,189	233.184	$657	4.60	$1,361,275	6.40%	3.08	$5,838	0.96
1983	$238,816	235.439	$1,014	7.10	$1,576,316	15.80%	3.57	$6,695	1.10
1984	$204,061	237.663	$859	6.01	$1,722,242	9.26%	3.90	$7,247	1.20
1985	$225,121	239.134	$941	6.59	$1,926,973	11.89%	4.36	$8,058	1.33
1986	$227,806	241.304	$944	6.61	$2,183,514	13.31%	4.94	$9,049	1.49
1987	$149,768	243.479	$615	4.30	$2,346,125	7.45%	5.31	$9,636	1.59
1988	$149,750	245.73	$609	4.26	$2,510,187	6.99%	5.68	$10,215	1.69
1989	$140,795	248.061	$568	3.97	$2,648,235	5.50%	5.99	$10,676	1.76
1990	$196,002	250.689	$782	5.47	$2,838,923	7.20%	6.42	$11,324	1.87
1991	$228,807	253.426	$903	6.32	$3,058,907	7.75%	6.92	$12,070	1.99
1992	$239,765	256.271	$936	6.55	$3,304,273	8.02%	7.48	$12,894	2.13
1993	$205,758	257.908	$798	5.58	$3,509,206	6.20%	7.94	$13,606	2.25
1994	$160,697	260.662	$616	4.31	$3,672,950	4.67%	8.31	$14,091	2.33

Appendix C – Real Deficit and Debt as Percentages of Real GDP, 1940-1995

Year	Real GDP (Billions)	Percentage Increase From Prev. Year	Real Deficit or (Surplus) (Millions)	Real Deficit Pct. of Real GDP	Real End-of-Year Debt (Millions)	Percentage Increase From Prev. Year	Real Debt Pct. of Real GDP
1940	$831.7	——	$25,458	3.06%	$441,988	——	53.14%
1941	$941.4	13.19%	$41,347	4.39%	$481,431	8.92%	51.14%
1942	$1,122.7	19.26%	$162,336	14.46%	$627,078	30.25%	55.85%
1943	$1,345.1	19.81%	$418,359	31.10%	$1,093,926	74.45%	81.33%
1944	$1,529.2	13.69%	$360,553	23.58%	$1,547,225	41.44%	101.18%
1945	$1,558.8	1.94%	$349,654	22.43%	$1,912,669	23.62%	122.70%
1946	$1,369.2	-12.16%	$102,680	7.50%	$1,746,076	-8.71%	127.53%
1947	$1,201.6	-12.24%	($21,660)	——	$1,386,248	-20.61%	115.37%
1948	$1,262.5	5.07%	($60,368)	——	$1,289,821	-6.96%	102.16%
1949	$1,295.4	2.61%	($2,860)	——	$1,245,611	-3.43%	96.16%
1950	$1,327.7	2.49%	$15,579	1.17%	$1,282,982	3.00%	96.63%
1951	$1,485.8	11.91%	($28,919)	——	$1,209,896	-5.70%	81.43%
1952	$1,585.9	6.74%	$7,075	0.45%	$1,206,786	-0.26%	76.09%
1953	$1,654.4	4.32%	$29,527	1.78%	$1,209,472	0.22%	73.11%
1954	$1,656.2	0.11%	$5,194	0.31%	$1,218,776	0.77%	73.59%
1955	$1,700.0	2.64%	$13,226	0.78%	$1,212,399	-0.52%	71.32%
1956	$1,775.3	4.43%	($16,832)	——	$1,162,870	-4.09%	65.50%
1957	$1,807.4	1.81%	($14,070)	——	$1,122,689	-3.46%	62.12%
1958	$1,806.1	-0.07%	$11,161	0.62%	$1,127,231	0.40%	62.41%
1959	$1,884.6	4.35%	$50,428	2.68%	$1,128,199	0.09%	59.86%
1960	$1,934.1	2.63%	($1,154)	——	$1,113,549	-1.30%	57.57%
1961	$1,963.5	1.52%	$12,666	0.65%	$1,111,462	-0.19%	56.61%
1962	$2,071.6	5.51%	$26,660	1.29%	$1,130,328	1.70%	54.56%
1963	$2,143.4	3.47%	$17,440	0.81%	$1,137,968	0.68%	53.09%
1964	$2,259.8	5.43%	$21,377	0.95%	$1,142,244	0.38%	50.55%
1965	$2,372.7	5.00%	$4,989	0.21%	$1,139,738	-0.22%	48.04%
1966	$2,524.5	6.40%	$12,691	0.50%	$1,127,697	-1.06%	44.67%
1967	$2,632.9	4.29%	$28,682	1.09%	$1,129,920	0.20%	42.92%
1968	$2,710.2	2.94%	$80,489	2.97%	$1,179,415	4.38%	43.52%
1969	$2,819.7	4.04%	($9,875)	——	$1,114,130	-5.54%	39.51%
1970	$2,847.2	0.98%	$8,211	0.29%	$1,100,610	-1.21%	38.66%
1971	$2,886.3	1.37%	$63,260	2.19%	$1,121,055	1.86%	38.84%
1972	$2,996.1	3.80%	$61,008	2.04%	$1,137,917	1.50%	37.98%
1973	$3,168.4	5.75%	$37,075	1.17%	$1,159,639	1.91%	36.60%
1974	$3,243.1	2.36%	$14,175	0.44%	$1,118,052	-3.59%	34.47%
1975	$3,173.2	-2.16%	$111,900	3.53%	$1,138,976	1.87%	35.89%
1976	$3,286.9	3.58%	$143,895	4.38%	$1,227,498	7.77%	37.35%
1977	$3,461.9	5.32%	$96,892	2.80%	$1,275,547	3.91%	36.85%
1978	$3,617.6	4.50%	$99,354	2.68%	$1,303,680	2.21%	36.04%
1979	$3,752.7	3.73%	$62,913	2.65%	$1,281,233	-1.72%	34.14%
1980	$3,746.2	-0.17%	$104,612	1.68%	$1,287,971	0.53%	34.38%
1981	$3,812.2	1.76%	$101,565	2.74%	$1,279,379	-0.67%	33.56%
1982	$3,736.9	-1.98%	$153,189	2.72%	$1,361,275	6.40%	36.43%
1983	$3,811.2	1.99%	$238,816	4.02%	$1,576,316	15.80%	41.36%
1984	$4,067.1	6.71%	$204,061	5.87%	$1,722,242	9.26%	42.35%
1985	$4,206.6	3.43%	$225,121	4.85%	$1,926,973	11.89%	45.81%
1986	$4,344.1	3.27%	$227,806	5.18%	$2,183,514	13.31%	50.26%
1987	$4,452.4	2.49%	$149,768	5.12%	$2,346,125	7.45%	52.69%
1988	$4,640.0	4.21%	$149,750	3.23%	$2,510,187	6.99%	54.10%
1989	$4,776.8	2.95%	$140,795	3.13%	$2,648,235	5.50%	55.44%
1990	$4,853.0	1.60%	$196,002	2.90%	$2,838,923	7.20%	58.50%
1991	$4,825.2	-0.57%	$228,807	4.06%	$3,058,907	7.75%	63.39%
1992	$4,889.0	1.32%	$239,765	4.68%	$3,304,273	8.02%	67.59%
1993	$5,047.3	3.24%	$205,758	4.75%	$3,509,206	6.20%	69.53%
1994	$5,246.9	3.95%	$160,697	3.92%	$3,672,950	4.67%	70.00%
1995	$5,409.8	3.10%	$148,264	2.97%	$3,821,264	4.04%	70.64%

Appendix D -- Annual GDP Deflator Indexes, 1940-1995 (Base Year: 1987)

1940 ..... 0.1147	1959 ..... 0.2548	1977 ..... 0.5538
1941 ..... 0.1195	1960 ..... 0.2609	1978 ..... 0.5957
1942 ..... 0.1263	1961 ..... 0.2633	1979 ..... 0.6474
1943 ..... 0.1304	1962 ..... 0.2680	1980 ..... 0.7058
1944 ..... 0.1319	1963 ..... 0.2727	1981 ..... 0.7776
1945 ..... 0.1360	1964 ..... 0.2767	1982 ..... 0.8355
1946 ..... 0.1552	1965 ..... 0.2828	1983 ..... 0.8702
1947 ..... 0.1855	1966 ..... 0.2913	1984 ..... 0.9085
1948 ..... 0.1954	1967 ..... 0.3013	1985 ..... 0.9432
1949 ..... 0.2028	1968 ..... 0.3126	1986 ..... 0.9712
1950 ..... 0.2002	1969 ..... 0.3283	***1987 ..... 1.0000***
1951 ..... 0.2110	1970 ..... 0.3461	1988 ..... 1.0363
1952 ..... 0.2147	1971 ..... 0.3641	1989 ..... 1.0830
1953 ..... 0.2199	1972 ..... 0.3831	1990 ..... 1.1295
1954 ..... 0.2222	1973 ..... 0.4021	1991 ..... 1.1764
1955 ..... 0.2263	1974 ..... 0.4328	1992 ..... 1.2112
1956 ..... 0.2345	1975 ..... 0.4758	1993 ..... 1.2400
1957 ..... 0.2425	1976 ..... 0.5124	1994 ..... 1.2643
1958 ..... 0.2481	TQ 0.5308	1995 ..... 1.2984